

**Overall Comments****Major comment from Debra Smiley for Bonneville Power Administration**

The Bonneville Power Administration (BPA) appreciates the opportunity to comment on draft DOE Order 452.2E, Nuclear Explosive Safety Program. BPA has no comments to the draft Order as written. Again, BPA appreciates the opportunity to review and comment on the draft Order.

**Response:**

*Accept* You are welcome.

**Suggested comment from Marilyn Jacobs for Headquarters EM**

No Comment

**Response:**

*Accept*

**Included comments:****Bobby Williams for Office of River Protection**

No Comment

**Response:**

*Accept*

**Jenni Hamilton for Oak Ridge Office (EM)**

The Oak Ridge Environmental Management organizations have no comments to provide at this time.

**Response:**

*Accept*

**Andrea Cooper for Carlsbad Field Office**

No Comment

**Response:**

*Accept*

**Jodi Dawson for Richland Operations Office**

No Comment

**Response:**

*Accept*

**Suggested comment from Steve Duarte for Headquarters GC****Included comments:**

SME melinda.comfort@hq.doe.gov

No Comment

**Response:**

*Accept*

**Suggested comment from Bill Schwartz for Headquarters HG**

This package represents the official, consolidated comments of **Poli A. Marmolejos, Director**

No Comment

**Response:**

*Accept*

**Suggested comment from Emily Jackson for Headquarters LM**

No Comment

**Response:**

*Accept*

**Suggested comment from LaVerne Fuller for Headquarters MA**

This package represents the official, consolidated comments of **N/A - Comment package automatically submitted.**

No Comment

**Response:**

*Accept*

**Suggested comment from Cathy Tullis for Headquarters NA**

This package represents the official, consolidated comments of **Cathy Tullis**

**Included comments:**

**SME [leslie.winfield@nnsa.doe.gov](mailto:leslie.winfield@nnsa.doe.gov)**

Over time, NEOs changed from being approved by NES to being reviewed by the NES process. The areas still approved by NES are dual lock or other security systems (Attachment 2, paragraph 1.) transportation conveyances [paragraph 4a.(11)(c)1 and Attachment 1 paragraph 11.b.(1)], and criteria and restraint de [paragraph 4a.(11)(c)2, and Attachment 1 paragraph 11.b.(2)]. Suggest that the NES approval be reflected in the Responsibilities section of this order.

**Response:**

*Accept with Modifications* A very good point. NESSG's no longer "approve" any operations or systems. They evaluate the NEOs (including transportation certain security systems) against the NES standards and other NES requirements. Globally, we changed "NES-approved" to "NESSG-evaluated" for those systems formally requiring NES approval. Also, removed "approval" from transportation processes in 4a(11)(c)1 and 2.

**Suggested comment from PK Niyogi for Headquarters NE****Included comments:**

**Jenni Hamilton for Oak Ridge Office-NE**

The Oak Ridge Nuclear Energy organizations have no comments to submit at this time.

**Response:**

*Accept*

**SME [gorhamml@id.doe.gov](mailto:gorhamml@id.doe.gov)**

No Comment

**Response:**

*Accept*

**SME [bundeka@id.doe.gov](mailto:bundeka@id.doe.gov)**

No Comment

**Response:**

*Accept*

**Christie Melbihess for Idaho National Laboratory - NE**

No Comment

**Response:**

*Accept*

**Suggested comment from Jennifer Kelley for Headquarters SC**

This package represents the official, consolidated comments of **Joe McBrearty, Deputy Director for Field Operations**

No Comment

**Response:**

*Accept*

**Suggested comment from Sharon Edge-Harley for Headquarters AU (formerly HS)**

No Comment

**Response:**

*Accept*

**Suggested comment from Rauland Sharp for Headquarters HC**

This package represents the official, consolidated comments of **Rauland Sharp**

No Comment

**Response:**

*Accept*

**Suggested comment from John Wall for Headquarters CF**

No Comment

**Response:**

*Accept*

**1-3. PURPOSE; CANCELLATION; APPLICABILITY****Major comment from Steve Duarte for Headquarters GC****Included comments:**

**SME [Stephen.Smith@hq.doe.gov](mailto:Stephen.Smith@hq.doe.gov)**

The link in 3.a. does not work.

**Response:**

*Accept with Modifications*

Section 3.a Paragraph 1 changed to, "a. Departmental Elements. This Order applies to NNSA which is the only Departmental element that is involved in performing managing, overseeing, and directly supporting NEOs and associated activities."

Another comment pointed out this this directive requires a NNSA SD (NA SD 452.2) to be followed. This SD has not been through DOE RevCom; however, it has through NNSA's review and comment process and, like this directive, only applies to DOE elements that perform nuclear explosive operations, which is only NNSA's

**SME** robin.henderson@hq.doe.gov

The DOE elements to which the Order applies should be specified, rather than stating that it applies to all elements, except the 25+ elements listed in paragraph 3c. aware of any organization in DOE other than NNSA that conducts these types of operations. If there are any others, it should be easy to list. I note that OGC and E not listed in 3c. There are probably others that should be exempt as well. However, the exemptions would not be necessary if the appropriate offices are listed here

In the first line of the second paragraph, please delete "and contractors." For important legal reasons, the Administrator should not be "ensur[ing]" the compliance of contractor.

**Response:**

*Accept*

Changed Section 3.a. Paragraph 1 as follows: "a. Departmental Elements. This Order applies to NNSA which is the only Departmental element that is involved in performing, managing, overseeing, and directly supporting NEOs and associated activities."

Deleted Section 3.c.2.

Changed as follows, "The NNSA Administrator will ensure that NNSA employees comply with their respective responsibilities under this directive. Nothing in this will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration-specific policy unless disapproved by the Secretary."

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

**SME** Jose.Munoz@nnsa.doe.gov

The web site (<http://www.directives.doe.gov/pdfs/reftools/org-list.pdf>) is no longer available.

Correct hyperlink or delete reference and provide most current listing w/in the Order.

**Response:**

*Accept* The link has been corrected. It was changed to: [https://www.directives.doe.gov/references/doe\\_departmental\\_elements](https://www.directives.doe.gov/references/doe_departmental_elements)

#### Suggested comment from Steve Duarte for Headquarters GC

##### Included comments:

**SME** james.jurich@hq.doe.gov

3b(3) should be stated to say: "Attachments 2 through 5 apply to federal employees and contractors." to distinguish the difference between federal employees and contractors.

Recommend including paragraph 3(b)(4) in paragraph 5(b) Responsibilities for NNSA Field Element Managers.

**Response:**

*Accept*

Changed first sentence of Section 3b(3) as recommended: "Attachments 2 through 5 apply to federal employees and contractors."

Added the following to Section 5(b): "Provide direction to the contracting officers to ensure that the CRD and Attachments 2 through 5 of this directive are included in appropriate contracts."

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

**SME** leslie.winfield@nnsa.doe.gov

As DOE O 151.1C is explicitly applicable to the development, coordination, control, and direction of all emergency: planning; preparedness; readiness; assurance; response; and recovery actions, this order should be equally clear it is not applicable to the same defined emergency actions and/or operations.

**Response:**

*Accept with Modifications*

Intent is clear, however, changed "those" to "accidents".

**SME** ROGERSKY@NV.DOE.GOV

The use of the term "unscheduled" events does not adequately describe emergency or accident occurrences. Consider using accidentally or emergency instead.

**Response:**

*Accept with Modifications*

Intent is clear, however, changed "those" to "accidents".

**Suggested comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

Please put periods after U, S, and C in "USC."

**Response:**

*Accept*

"50 USC" changed to "50 U.S.C."

**4. REQUIREMENTS**

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

Please change the third sentence as follows: "It includes the following: NES Rules (NESRs, general and supplemental), formal NES . . ."

**Response:**

*Accept*

Put "NESRs" in front of general as suggested.

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME KELLYDJ@NV.DOE.GOV**

It is suggested that this order make a distinction between generic and specific NEOs for the application of NES requirements using definitions provided in Appendix A, Table 3 of 10 CFR 830, subpart B. For example, it may not be value added to perform a NES evaluation on the staging of an unspecified NEC as-shipped configuration received from DOD (nuclear weapon met similar surety standards for DOD staging without a NES evaluation). Also, it may not be appropriate to perform a NES evaluation on a damaged nuclear weapon that has been rendered safe and transitioned from DOE 151 to 452 series requirements for NES evaluation. The application of NES evaluation could preclude or delay the receipt of known safe generic NEO. The application of NES requirements is applicable to specific NEOs as defined by 10 CFR 830.

**Response:**

*Reject* NA SD 452.2 describes two different types of NES Studies (NESSs): Specific (often programmatic by "tail number") NESSs and NES Master Studies. NESSs are somewhat generic in nature usually concentrating on nuclear explosive facilities or general systematic programs (e.g. electrical equipment, security equipment). Once the transition from DOE O 151 to DOE 452 series occurs, any further operation involving the damaged nuclear explosive must undergo a NES evaluation before that operation can occur. However, the transition from emergency space to normal operations space does not have to occur once the unit is "rendered safe". The requirement to perform a NES evaluation should not prohibit a weapon that has been rendered safe from being delivered to a safe and secure site. Thereafter, the nuclear explosive should remain under "emergency space" until the proper evaluation is completed (which should not take very long assuming proper prior information is given to the event). Also, while in "emergency space" a WRSET will be evaluating the nuclear explosive safety of the operations.

**Suggested comment from Sharon Edge-Harley for Headquarters IEA (Independent Enterprise Assessment)**

EA-10-20-30 POC: Kathy McCarty 3-8812

**Section**

4.a.(1)(c)4 - Suggested comment: It appears that the reference to 4a(1)(c)2 in this paragraph should be 4.a.(1)(c)3.

**Response:**

*Accept* Corrected reference by deleting 1.

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:****SME sesleza@sandia.gov**In paragraph 4, the sentence should cite paragraph 4a(1)(c)3 instead of 4a(1)(c)2.**Response:***Accept* Corrected by deleting 1.**SME robbins12@llnl.gov**

Item (c)4 is an unnecessary requirement and should be removed. All NEO, even ones conducted at NNSS, are required to have a NES evaluation and close for which a NES standard has not been met. This is a holdover requirement from days of underground testing an no longer applies.

**Response:***Reject*

If it is determined that a nuclear explosive is not one point safe, then it is preferable that such operations be conducted at the NNSS.

**SME robbins12@llnl.gov**The reference in item 4 is incorrect due to the re-ordering of this section. The reference to 4a(1)(c)2 should reference 4a(1)(c)3.**Response:***Accept* This was corrected by deleting 1.**SME William.Pulse@nnsa.doe.gov**Paragraph 4a(1)(c)4 incorrectly references the wrong sub-paragraph. The correct paragraph to cite in 4a(1)(c)4 is 4a(1)(c)3. (Basis: 452.2D, 4a(1)(c)3 reference 4a(1)(c)2, which describes the process to resume NEOs.)Given that this is a NES Rule, it is inconsistent to refer to "findings for which a NES standard has not been met" in 4a(1)(c)3 since the NES Standards do explicitly mention one-point safety. Recommend that the 452.2D, 4a(1)(c)2 language be retained.**Response:***Accept with Modifications*Corrected reference by deleting 1.

NES Rules are not the same as NES standards. So this statement essentially states that IF it was discovered that a nuclear explosive is not one point safe, then further operations cannot continue until a NES evaluation is completed (by a NESSG), and all findings where a NES standard is not met (formerly called "a start finding) are closed. The language from DOE O 452.2D cannot be retained because NES reports are no longer approved by NA-12 and the terminology "start" and "post-start" have been deleted.

**Suggested comment from Cathy Tullis for Headquarters NA****Included comments:****Jennifer Bitsie for Sandia Field Office**In paragraph 4, the sentence should cite paragraph 4a(1)(c)3 instead of 4a(1)(c)2. (Changed to Major to Suggested per SFO)**Response:***Accept* Corrected reference by deleting 1.**Major comment from Steven Petras for HSS-DR-DNFSB****DNFSB Comments for 4.a.(1)(d)2 & 3:****[C] In both sections, the language formerly said "identified and eliminated or minimized and controlled." The change to "reasonably minimized" greatly weakens these NESRs and makes them unenforceable. It is not consistent with the NES Standards to add the reasonable modifier to this NESR; either the language should be minimized and controlled or not. The term "reasonable" can mean "showing reason or sound judgment," which should be assumed will be done. It is not needed. Alternatively, "reasonable" can mean "having modest or moderate expectations; not making unfair demands" - if that is the intended meaning, then the NESR would not be strong enough to ensure the NES Standards are met. Either way, the addition of "reasonably" is inappropriate.****[S] Remove "reasonably" in 2 and 3****Response:***Accept* The word "reasonably" was removed from 4.a.(1)(2)2 & 3.**DNFSB Comments for 4.a.(1)(d)2 & 3:****[C] In both sections, the language says "identified and eliminated or reasonably minimized and controlled." The grammar is confusing. It should communicate that the items are always identified and either (1) eliminated or (2) minimized and controlled.****[S] Change language to say "... must be identified and either (1) eliminated or (2) minimized and controlled, in order to prevent adverse interaction ..."****Response:***Accept* For Sections 4.a.(1)(d) 2 & 3, changed to "... must be identified and either (1) eliminated or (2) minimized and controlled, in order to prevent adverse interaction ..."**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME leslie.winfield@nnsa.doe.gov**

Paragraph 4a.(1)(d)1 - Eliminate "Authorized" as all energy sources must be identified and documented at some point. This also aligns the paragraph with the following two paragraphs.

**Response:**

*Accept*

Deleted "Authorized". Authorized is clearly implied by the second sentence; therefore, this "Authorized" is redundant.

**SME lluna@sandia.gov**

Delete Reasonably Minimized in paragraphs 2 & 3 as these terms are undefined. Eliminated or controlled is adequate for these paragraphs.

**Response:**

*Accept*

The term "reasonably" was deleted from paragraphs 2 & 3.

**SME robbins12@llnl.gov**

The term 'reasonably' has been added to the term 'minimize'. This is unnecessary as NES evaluations are already qualitative and the use of additional subject modifiers only obfuscates the intent. NESSG discussion should focus on whether the ignition sources and combustible materials have been minimized, not reasonable. It is understood that the term 'minimize' is similar to the use of 'prevent' in the NES standards; the objective is to drive the likelihood as low as reasonably practicable.

**Response:**

*Accept* The term "reasonably" was deleted from paragraphs 2 & 3.

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

This comment applies to all references to NNSA Supplemental Directives: they should not be incorporated into DOE Directives as requirements that apply to NNSA employees and contractors because they have not gone through RevCom review. If you change the applicability section to only NNSA and NNSA contractors, I do not object to the use of NNSA Supplemental Directives as requirements.

**Response:**

*Accept*

Currently, only NNSA performs nuclear explosive operations. Changed the applicability section to NNSA.

Paragraph 3.a. now states, "a. Departmental Elements. This Order applies to NNSA which is the only Departmental element that is involved in performing, managing, overseeing, and directly supporting NEOs and associated activities."

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

For improved clarity, please change the last sentence to read as follows: "NEOs shall be conducted using established research in human factors and ergonomics."

**Response:**

*Accept with Modifications*

Deleted the sentence starting with. "Given the human-centric...."

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**Linell Carter for Pantex - BWXT Pantex, LLC**

4.a.(4) Add language to the Human Factors section that only imposes the new human factors requirements into startup NEOs and newly designed testers, test facilities, and equipment. Existing NEOs that are undergoing OSRs or minor process modifications (i.e. NCEs) should not be subjected to the additional scrutiny that could potentially be raised by this requirement. Proposed language is as follows: "Newly proposed (startup) NEOs must incorporate human factors principles into NEO procedures, processes, facility layouts, new tooling and new equipment, including new Category 1 electrical equipment, starting with the NEO development phase and maintained throughout the lifecycle of NEOs...." In addition, the following statement should be added: "Existing NEOs that are being evaluated under an OSR or NCE process should strive to meet human factors principles to the extent possible."

**Response:**

*Accept with Modifications* Changed Section 4.a.(4) as follows:

(4) Human Factors. Newly proposed (startup) NEOs must incorporate human factors principles into NEO procedures, processes, facility layouts, new tooling equipment, including Category 1 electrical equipment, starting with the NEO design and development phase and maintained throughout the lifecycle of NE Existing NEOs that are being evaluated (i.e. during an OSR or NCE) should strive to meet human factors principles to the extent reasonably achievable.

Organizations developing NEOs must consider the application of established research in human factors and ergonomics, including human-system interface human cognition and perception, stress and workload, anthropometry and workspace design, environmental factors, training, and human error.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME [Illuna@sandia.gov](mailto:Illuna@sandia.gov)

In subparagraph a, after original issues add "and procedure changes" as changes to procedures can significantly impact Nuclear Safety.

##### Response:

*Reject* Not all procedure changes are signed by design agencies. The design agencies have released IERs which state which procedure changes require review. Also, even the procedure changes that the design agencies have to sign do not necessarily get a NES person reviewing them. The DA signature requires a review of the procedure against design agency specifications (primarily quality), not NES requirements. The NES change control process (which does review procedure changes) is relied upon for recognizing changes that may affect nuclear explosive safety.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME [William.Pulse@nnsa.doe.gov](mailto:William.Pulse@nnsa.doe.gov)

Paragraph 4a(4) invokes human factors considerations for "NEO procedures, processes, facilities, tooling and equipment, including Category 1 electrical equipment." However, paragraph 4a(5)(b)5 invokes again the need to incorporate "human factors consideration" when the other areas of a NEO (e.g., facilities, tooling, etc.) do not repeat the requirement to incorporate human factors considerations. Since 452.2E, paragraph 4a(4) is a "new" requirement when compared to 452.2D, 4a, it is recommended that 4a(5)(b)5 be removed as a duplicate requirement.

##### Response:

*Accept*

4a(5)(b)5 was deleted due to redundancy.

#### Suggested comment from Steve Duarte for Headquarters GC

##### Included comments:

SME [Stephen.Smith@hq.doe.gov](mailto:Stephen.Smith@hq.doe.gov)

Are there any recognized standard procedures for carrying out such characterization, evaluation, and approval? Will they be readily known to those persons to the directive?

##### Response:

*Accept*

Changed sentence to, "Facilities. Facilities used for nuclear explosive operations must be characterized, evaluated, and specifically approved for that use as documented in a 10 CFR 830 documented safety analysis."

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME [Jose.Munoz@nnsa.doe.gov](mailto:Jose.Munoz@nnsa.doe.gov)

Requirement indicates that facilities must be characterized, evaluated, and specifically approved for use but does indicate if this is a NESSG responsibility.

Recommend identifying who is responsible for ensuring facilities are approved for use.

##### Response:

*Accept with Modifications*

Changed sentence to, "Facilities. Facilities used for nuclear explosive operations must be characterized, evaluated, and specifically approved for that use as documented in a 10 CFR 830 compliant documented safety analysis." The DSA is part of the input document that the NESSG reviews. This is described in SD 452.2.

#### Major comment from Steven Petras for HSS-DR-DNFSB

##### DNFSB comments for 4.a.(8)(e):

[C] The paragraph adds a requirement to evaluate and characterize energetic equipment carried by emergency responders but does not discuss the need for controls or other risk mitigation. Exemptions can be pursued for any equipment where practical compensatory measures may not exist or the need for controls of the energetic equipment may be more important than the increased risk to NES.

[S] Add a requirement to evaluate, characterize, *and control* any hazards posed by energetic equipment carried by emergency responders.

**Response:***Reject*

Actual emergencies take precedence to nuclear explosive safety controls. Controls are in place to control such energetic equipment in non-emergency situations.

**Major comment from Cathy Tullis for Headquarters NA****Included comments:****Linell Carter for Pantex - BWXT Pantex, LLC**

4.a.(8)e Energetic equipment intended for use in NEAs by emergency responders that must be evaluated and characterized with respect to potential hazard not include security force equipment. Due to the nature of emergency scenarios that would mandate a security force response, this evaluation would be counterproductive and could unnecessarily impede security from responding as needed to a significant event. Accordingly, the reference to "security force" be deleted.

**Response:**

*Reject* Actual security emergencies take precedence to nuclear explosive safety controls. Performance of an evaluation does not prohibit security response to security emergency.

**Suggested comment from Cathy Tullis for Headquarters NA****Included comments:****SME Illuna@sandia.gov**

In paragraph (b) add or a weapon component supporting high explosive or nuclear materials as often weapon components are held by tools and the components used to support the explosives or other components.

**Response:**

*Reject* This paragraph addresses design of the tool/equipment, not the weapon component. I agree that if the analysis relies on the component as part of the analysis, then they should have analysis supporting the assumptions.

**SME Jose.Munoz@nnsa.doe.gov**

Requirement (e) above indicates that energetic equipment must be evaluated and characterized w/ respect to potential hazards but does indicate if this is a NE responsibility or performed as part of the safety basis process.

Recommend identifying who is responsible for evaluated and characterized energetic equipment w/ respect to potential hazards.

**Response:***Reject*

Paragraph 8 states, "Organizations responsible for NEOs and associated activities and facilities must verify that all equipment used in NEAs (including tool testers, and other mechanical and electrical equipment) meet the following requirements." The NESSG does not perform any analysis. The organization responsible for NEOs (e.g. Pantex) prepares all of the information and includes it in a NES input document. This process is described in more detail NA SI

**Suggested comment from Cathy Tullis for Headquarters NA****Included comments:****SME Jose.Munoz@nnsa.doe.gov**

The requirement indicates generically what maintenance implementation plans must include; however, there is no indication as to when these plans need to be developed, how often do they need to be updated, or are there any approvals required, etc.

Provide specifics regarding the development, change control, and approval of the maintenance implementation plans.

Additionally, are these plans required to meet the requirements of DOE O 433.1B *Maintenance Management Program for DOE Nuclear Facilities*?

**Response:**

*Reject* This directive does not require the NEO organizations to meet DOE O 433.1B; however, it may be in their contract. Change control is performed by M&O NES change control group. This process is described in detail in NA SD 452.2. Section 4.a.(14) of this Order directs implementation of a NES change control process and points to the SD for details.

**Suggested comment from Steve Duarte for Headquarters GC****Included comments:****SME robin.henderson@hq.doe.gov**

Please put periods after the C, F, and R in "CFR." This comment applies to all references to "CFR."

**Response:**

*Reject* According to [http://www.gpo.gov/help/index.html#about\\_code\\_of\\_federal\\_regulations.htm](http://www.gpo.gov/help/index.html#about_code_of_federal_regulations.htm), periods are not required when citing CFR.

**Suggested comment from Sharon Edge-Harley for Headquarters IEA (Independent Enterprise Assessment)**

EA-10-20-30 POC: Kathy McCarty 3-8812

Section

4.a.(11)(b) - Suggested comment:  
Identify the acronym OST on first use.  
Instead, it is defined on third use in 4.a.(15)(b)2.

**Response:**

*Accept* Inserted "Office of Secure Transportation" before "OST" and put "OST" in parentheses. Also, deleted "(OST)" from 4.a(15)(b)2.

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

In paragraph (b), please insert "Office of Secure Transportation" before "OST" and put "OST" in parentheses.

**Response:**

*Accept* Inserted "Office of Secure Transportation" before "OST" and put "OST" in parentheses.

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**Linell Carter for Pantex - BWXT Pantex, LLC**

4.a.(11) Suggest deleting the introductory sentence that reads "Nuclear explosive transportation is a mobile NEO and involves a mobile NEA". It is too sul and does not clearly convey a requirement.

**Response:**

*Reject*

The requirement is stated to make it clear that the NES hazards encountered during transportation must be considered, and the area that the nuclear explosiv occupies must be treated as a nuclear explosive area. As Section 11.a. states, contractors establish the specific requirements and procedures to ensure safe o transportation of nuclear explosives. Therefore, contractors may determine the area around the nuclear explosive that constitutes the NEA and based upon th nuclear explosive transportation configuration. For example, during onsite truck transportation, the contractor may determine that the NEA consists of the a inside the truck (i.e. the trailer) with the doors of the truck closed because they have determined that all of the hazards are bounded by those considered in o road transportation.

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

Please write in "Nuclear Explosive Safety Study Group" before "NESSG" and put "NESSG" in parentheses.

**Response:**

*Accept* Inserted "Nuclear Explosive Safety Study Group" before "NESSG" and put "NESSG" in parentheses.

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME robbins12@llnl.gov**

The exceptions are much too specific for a DOE Order. From a safety perspective, I would question whether an exception is ever truly necessary and rem noted exception. If it is desired to establish a process for exceptions to this requirement, there is no need to mention specific operations/facilities by name.

**Response:**

*Accept with Modifications* Deleted the sentence, "Exception: Nuclear explosives and NELAs may be collocated...". Added, "If operational constraints requi nuclear explosives and NELAs to be collocated, the operations must comply with the NELA standards in paragraph 17 of this attachment and must be evalt a NESSG. The operational justification for collocation of the nuclear explosives and NELAs will be provided to the NESSG during the evaluation."

**SME lluna@sandia.gov**

Conder adding a requirement for a Non-Nuclear Verification (NNV) prior to movement of a NELA from a facility which allows mixed venues.

**Response:**

*Reject* An NNV is not necessary as long as other controls are in place prior to movement and the NNV that are already required by this directive are conduc

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME Jose.Munoz@nnsa.doe.gov**

Requirement (8)(e) above states, "Positive measures must be used to preclude use of facility equipment that is not approved for the NEO and impracticable remove."

Recommend including this part of the requirement as part of the positive verification requirements.

#### Major comment from Steve Duarte for Headquarters GC

##### Included comments:

SME robin.henderson@hq.doe.gov

In the first paragraph, please insert "Department of Defense" before "DoD" and put "DoD" in parentheses.

##### Response:

*Accept* Inserted "the Department of Defense" and put "DoD" in parentheses.

#### Major comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME robbins12@llnl.gov

Under SMT guidance, Pantex has interpreted the memo from Dr Greenaugh regarding anomalous unit guidance differently than what is suggested here. I two differences are worth highlighting and updating in this section of the Order.

1) While the personnel mentioned in the draft certainly provide relevant input, the final anomalous unit decision is coordinated with senior management delegates at each affected site. Senior management consists of the following

- Pantex - General Manager
- Sandia National Laboratory – Director, Weapons Systems Engineering (CA or NM)
- Lawrence Livermore National Laboratory - Program Director Nuclear Weapon Engineering (NWE) Program
- Los Alamos National Laboratory – Associate Director for Weapon Engineering Experiments

##### 2)Reassessment of an Anomalous Unit Declaration

If additional information is obtained after a unit has been declared anomalous, the new information shall be evaluated to determine if the unit remain anomalous. This process is effectively the same as a new anomalous unit determination.

##### Response:

*Accept with Modifications*

Once a unit is declared anomalous, it must be treated as anomalous unless new information is presented that demonstrates no anomaly is present.

Added the following:

(d) If additional information is obtained after a unit has been declared anomalous (e.g. from a radiograph), the new information shall be evaluated to determine if the unit should remain anomalous.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME lluna@sandia.gov

Consider adding Design Agency NESS members to the people who can declare a unit anomalous.

##### Response:

*Accept with Modifications* This is currently the process that has been agreed to by NNSA, Pantex, and Design Agency Management. It would be beneficial to have a design agency system engineer to seek the opinion of their respective design agency NESSG members prior to making a decision, but is not required by this directive. Therefore, the following was added, " The design agency System Engineer may solicit input from their respective design agency NESSG members prior to making an anomalous unit determination."

#### Major comment from Steve Duarte for Headquarters GC

##### Included comments:

SME robin.henderson@hq.doe.gov

In the second sentence of the first paragraph, please change the parenthetical to read as follows: "(e.g., Special Instruction Engineering Release (SIER), (In

*Experiment Request*) IER, or Specification Exception Release (SXR), as appropriate)."

Paragraphs 1 and 2 are indented too much after the first lines of the paragraphs.

**Response:**  
*Accept with Modifications*

Deleted parenthetical expression.

#### **Suggested comment from Cathy Tullis for Headquarters NA**

##### **Included comments:**

**SME William.Pulse@nnsa.doe.gov**

It is recommended that SIER, IER and SXR, since they are acronyms, be defined when first used in accordance with DOE/NNSA format protocols.

**Response:**  
*Accept with Modifications* Deleted parenthetical expression.

#### **Suggested comment from PK Niyogi for Headquarters NE**

##### **Included comments:**

**SME christja@id.doe.gov**

Recommend including a reference to DOE O 420.1C Att. 2, Ch. V §3.c Configuration Management to ensure that requirements of both orders are being met.

**Response:**  
*Reject*

Configuration Management requirements here are those required specifically to address NES concerns.

#### **Major comment from Cathy Tullis for Headquarters NA**

##### **Included comments:**

**Linell Carter for Pantex - BWXT Pantex, LLC**

4.e. I disagree with the statement that "This revision does not involve substantive administrative or programmatic changes from the previous directives....An implementation plan is not required. This revision is effective upon issuance." Based upon the comments provided in this form, an impact evaluation and implementation plan is warranted.

**Response:**  
*Accept with Modifications* Changes were made to address the specific issues associated with those changes which PX viewed as substantive.

#### **Suggested comment from Cathy Tullis for Headquarters NA**

##### **Included comments:**

**SME ROGERSKY@NV.DOE.GOV**

DOE M 452.2-1A should be changed to NA SD 452.2

**Response:**  
*Reject*

The reference to DOE M 452.2-1A is correct. DOE O 452.2D and DOE M 452.2-1A have been combined into DOE O 452.2E. NA SD 452.2 replaces DOE M 452.2-2.

## **5. RESPONSIBILITIES**

#### **Major comment from Steve Duarte for Headquarters GC**

##### **Included comments:**

**SME james.jurich@hq.doe.gov**

Need to add a section on Contracting Officer responsibilities. Suggested format:

Contracting Officer.

Incorporates the CRD into affected contracts as directed.

**Response:**  
*Accept with Modifications*

Per comment from another source, added the following to Section 5b. (NNSA Field Element Managers responsible for NEOs): "Provide direction to the contracting officers to ensure that the CRD and Attachments 2 through 5 of this directive are included in the appropriate contracts."

Also, added Section 5.f:

f. Chair, Nuclear Explosive Safety Study Group

(1) Implements the NNSAA NES evaluation processes.

(2) Has final authority for NESS interpretation of NES Standards and other NES criteria during the performance of NES evaluations per 4.a.(3).

## **6. DEFINITIONS**

### **Major comment from Cathy Tullis for Headquarters NA**

#### **Included comments:**

**SME robbins12@llnl.gov**

Criteria (1) for Anomalous Units may be too broad and would apply to many units that pose no challenge to safety. One example might be a striped screw on a nuclear weapon, with that situation not covered by a credible deviation. While specific process/procedures would need to be developed and reviewed (including NES change control), would it really be appropriate to call the unit anomalous in this case? I suppose the question is whether 'anomalous unit' should be reserved for situation where experts believe there could be a real safety issue and special attention is required, or should the definition refer to any situation not specifically addressed by a procedure (which probably applies to many more cases). I suggest deleting criteria (1) from the definition.

#### **Response:**

*Accept* Added the following to the Anomalous Unit definition:

Minor damage or other non-conformances, such as units with scratches, bent connector pins, chipped insulators, stripped screws, etc., need not be considered an anomalous unit unless the condition is potentially adverse to nuclear explosive safety.

**Linell Carter for Pantex - BWXT Pantex, LLC**

6.b.(1) Delete the sentence defining an anomalous unit as "Damage or other condition not identified as a credible deviation or otherwise explicitly addressed in an approved technical operating procedure." This language is too restrictive as written and the NES concern with damage or other condition is adequately covered by (2) and (3). This proposed change is consistent with the existing language in 4.a.(f).

#### **Response:**

*Accept with Modifications*

Added the following to the Anomalous Unit definition:

Minor damage or other non-conformances, such as units with scratches, bent connector pins, chipped insulators, stripped screws, etc., need not be considered an anomalous unit unless the condition is potentially adverse to nuclear explosive safety.

### **Suggested comment from Cathy Tullis for Headquarters NA**

#### **Included comments:**

**SME lluna@sandia.gov**

Add Category 3 electrical equipment to this list as it is a source of electrical energy present in the facility.

#### **Response:**

*Accept with Modifications*

The first sentence includes Category 3 electrical equipment. However, added the following for clarity:

Category 3 electrical equipment does not interface with the nuclear explosive.

### **Major comment from Steve Duarte for Headquarters GC**

#### **Included comments:**

**SME robin.henderson@hq.doe.gov**

In paragraph h., please insert the word "Part" before "712" and put periods after the C, F, and R.

#### **Response:**

*Accept with Modifications* Inserted "Part" before "712". According to [http://www.gpo.gov/help/index.html#about\\_code\\_of\\_federal\\_regulations.htm](http://www.gpo.gov/help/index.html#about_code_of_federal_regulations.htm), periods are not required after C, F, and R.

### **Major comment from Steve Duarte for Headquarters GC**

#### **Included comments:**

**SME robin.henderson@hq.doe.gov**

Please insert the words "High Explosive" before "HE" and put "HE" in parentheses.

#### **Response:**

*Accept* Inserted "high explosive" before HE and put "HE" in parentheses.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

**Jennifer Bitsie for Sandia Field Office**

remove the text starting with but (if inadequately through "of a NELA". Call me at 505-844-8027 if questions. (Changed to Major to Suggested per SFO)

**Response:**

*Accept*

Accepted per discussion with Larry Luna of Sandia National Laboratories.

Changed to:

Nuclear Explosive-Like Assembly (NELA). An assembly that is not a nuclear explosive but represents a nuclear explosive in its basic configuration (main c HE and pit) or any higher level of assembly up to a fully assembled weapon configuration. A NELA does not contain an arrangement of high explosive (HE fissile material capable of producing a nuclear explosive detonation.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

**SME lluna@sandia.gov**

for "m" consider adding "in the same facility".

**Response:**

*Reject*

Adding the proposed phrase would add additional confusion.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

**SME lluna@sandia.gov**

in "p" consider adding or engraved in the carbon phenolic as the warheads do not have a metal stamp.

**Response:**

*Accept with Modifications*

added "or engraving".

#### Major comment from Steve Duarte for Headquarters GC

##### Included comments:

**SME robin.henderson@hq.doe.gov**

In paragraph q., please insert "Hazard Category 1, 2, or 3" before "DOE nuclear facility."

**Response:**

*Accept with Modifications*

Used the definition from 10 CFR Part 830:

Safety Basis. A safety basis means the documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment.

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

**SME Jose.Munoz@nnsa.doe.gov**

The definitions for "safety basis" and "two-person concept" are not definitions; recommend these be replaced w/ the following:

Safety Basis. means the documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment.

Two-Person Concept (TPC). A concept of operations requiring that a minimum of two authorized persons certified in the Human Reliability Program, each technical knowledge and being in a position to detect incorrect or unauthorized operations with respect to the task to be performed and familiar with pertinent and security requirements, be present during all operations that afford access to a nuclear explosive.

**Response:**

*Accept with Modifications*

Changed to the following:

Safety Basis. A safety basis means the documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment.

Two-Person Concept (TPC). A concept of operations implemented to ensure no lone individual has unrestricted access to a nuclear explosive or other crucial as specified by this Order.

#### Suggested comment from PK Niyogi for Headquarters NE

##### Included comments:

SME christja@id.doe.gov

Recommend using the same definition for safety basis as is contained in the Nuclear Safety Management statutes (10 CFR 830).

The definition for safety basis as contained in 10 CFR 830: "Safety basis means the documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment."

##### Response:

*Accept*

Changed to the following:

Safety Basis. A safety basis means the documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment.

## 7. REFERENCES

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME Jose.Munoz@nnsa.doe.gov

Text states, "The following list contains references that are relevant to this Order." However, DOE O 251.1C *Departmental Directives Program* indicates that "references" should be "List sources **cited in the directive** and **additional information sources to assist in implementing the directive**. A short statement of relevance to the Order should be included with each reference. Applicable sections of lengthy references should be identified where possible." [**bolded for emphasis**]

The list of references includes several references that are neither cited or would assist in the implementation of this Order.

Additionally there are some key references that are missing (e.g. DOE O 433.1B).

##### Response:

*Accept with Modifications*

Added DOE O 433.1B to the references. Added additional description to two of the references.

#### Major comment from Steve Duarte for Headquarters GC

##### Included comments:

SME robin.henderson@hq.doe.gov

In paragraph e., please replace "DOE/NNSA" with "DOE, including NNSA,". Please make this change throughout the Order.

##### Response:

*Accept* Replaced "DOE/NNSA" with "DOE, including NNSA"

#### Suggested comment from PK Niyogi for Headquarters NE

##### Included comments:

SME christja@id.doe.gov

DOE O 420.1C also contains the requirements for the Cognizant System Engineer Program, which includes the configuration management requirements for SSCs.

##### Response:

*Accept with Modifications* Added "and includes the configuration management requirements for Safety SSCs." The CSE program does not apply to NES or input documentation.

#### Major comment from Steve Duarte for Headquarters GC

##### Included comments:

SME robin.henderson@hq.doe.gov

In paragraph o., please insert "Natural Phenomena Hazard" before "NPH-" and put "NPH" in parentheses. Before "SSC" is used the first time, please insert "structure, system, or component" and put "SSC" in parentheses.

**Response:**

*Accept*

Changed to the following:

DOE-STD-1020-2012, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*, dated December 2012, provides criteria and guidance for the analysis and design of facility structures, systems, and components (SSCs) that are necessary to implement the requirements of DOE O 420.1C, Facility Safety, to ensure that the SSCs will be able to effectively perform their intended safety functions under the effects of natural phenomena hazards (NPHs).

Also reordered and renumbered references to be in numerical order by type (e.g. Orders, Standards, other).

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

SME robin.henderson@hq.doe.gov

Paragraph q. may need to be revised if the update of TS 1104 is completed before this Order is completed.

Please insert the word "Part" before "830" and put periods after C, F, and R.

**Response:**

*Accept with Modifications*

Inserted "Part" prior to "830". Did not insert periods after C, F, and R. According to [http://www.gpo.gov/help/index.html#about\\_code\\_of\\_federal\\_regulation](http://www.gpo.gov/help/index.html#about_code_of_federal_regulation), periods are not required when citing CFR.

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:**

SME William.Pulse@nnsa.doe.gov

7q must be updated to reflect that the latest version of DOE-STD-1104 is 2009 (i.e., DOE-STD-1104-2009).

It is not appropriate to refer to a draft DOE-STD-3009-94 that has a 2014 date. Please note that 3009 has change notices that should be specified.

**Response:**

*Accept*

Updated DOE STD 1104 to 2009. Updated DOE-STD-3009-94 with Change Notice 3 dated March 2006. Inserted "Part" prior to "830".

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

SME William.Pulse@nnsa.doe.gov

The 2006 version of the 3016 technical standard is "DOE-NA-STD-3016-2006." (Emphasis added.) Please correct.

**Response:**

*Accept* Replaced "DP" with "NA".

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

SME robin.henderson@hq.doe.gov

Paragraph v. is actually two references. Please split them into two paragraphs and re-letter the references from the second reference in v. until the end.

**Response:**

*Accept* Split the two references as appropriate.

**ATTACHMENT 1. CONTRACTOR REQUIREMENTS DOCUMENT**

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

SME james.jurich@hq.doe.gov

Heading for Attachment 1 in .pdf should read "DOE O 452.2E, Nuclear Explosive Safety" It currently reads "DOE O 452.2D"

The language that reads: "Attachments 2 through 5 apply to both federal and contractor employees" should read "Attachments 2 through 5 apply to both federal employees and contractors" to distinguish the difference between federal employees and contractors and to add clarity since contractors are not employees of the federal government.

**Response:***Accept with Modifications*

Changed "DOE O 452.2D" to "DOE O 452.2E".

Deleted the first sentence of the third paragraph. Changed the second sentence to read as follows, "Attachment 2 through 5 of this directive must be included with the CRD in all contracts that involve performing, managing, overseeing, or directly supporting NEOs or associated activities."

**Major comment from Cathy Tullis for Headquarters NA****Included comments:****SME KELLYDJ@NV.DOE.GOV**

It is appropriate to impose a requirement to incorporate the Contractor Requirements Document (CRD) in the contract as part of the CRD since it is obvious that the CRD is outside the purview of the Contractor to revise their own contract (DOE Contracting Officer responsibility). Likewise, it's unclear why a requirement to incorporate Attachments 2 through 5 to Federal employees is being imposed in a CRD since contractors don't establish requirements for Federal employees. Inherently Federal functions, such as updating contractual requirements, should be moved to the responsibility section of the order.

**Response:***Accept with Modifications*

Deleted the first sentence of the third paragraph. Changed the second sentence to read as follows, "Attachment 2 through 5 of this directive must be included with the CRD in all contracts that involve performing, managing, overseeing, or directly supporting NEOs or associated activities."

**1. General Nuclear Explosive Safety Rules****Suggested comment from Steve Duarte for Headquarters GC****Included comments:****SME robin.henderson@hq.doe.gov**

In c.(1), should "pound" be plural?

**Response:***Accept with Modifications*

Deleted 1.c.(1).

**Major comment from Cathy Tullis for Headquarters NA****Included comments:****SME KELLYDJ@NV.DOE.GOV**

Only the nuclear weapon Design Agencies are able to certify a NEO as being one-point safe. The revision to the Order inappropriately imposes this requirement on all contractors whose contracts include this Order. The responsibility for determining one-point safety should explicitly be assigned to Design Agencies (Nuclear Weapon Laboratories) rather than all contractors. Also, the evaluation of tool and equipment to ensure it doesn't impact one-point safety should be done as required by Design Agency review. Again, other contractors don't have the technical capability for this determination.

**Response:**

*Reject* 1.c(2) is not a new requirement and is found in DOE O 452.2D. The statement does not require the contractors who perform NEOs to perform the one-point safety analysis. Rather it requires those who perform the NEOs to ensure that the one point safety analysis is done. The organization performing the NEO is required to ensure that all equipment has been evaluated. For Pantex NEOs, the design agencies have provided PX engineers (formally through an engineering release) with some general guidance on what tooling and equipment, and what types of changes to the tooling need to be submitted to the design agencies for further evaluation. For Pantex NEOs, this process has been reviewed and found to be acceptable by a Nuclear Explosive Safety Study Group.

**SME robbins12@llnl.gov**

Item (c)4 is an unnecessary requirement and should be removed. All NEO, even ones conducted at NNSS, are required to have a NES evaluation and closeout for which a NES standard has not been met. This is a holdover requirement from days of underground testing and no longer applies.

**Response:***Reject*

It remains preferable to perform any operations where one-point safety is an issue at NNSS if such operations are feasible.

**Major comment from Steven Petras for HSS-DR-DNFSB****DNFSB Comments for Att 1, 1.d.(2) & (3):**

**[C]** In both sections, the language says "identified and eliminated or reasonably minimized and controlled." The grammar is confusing. It should come out that the items are always identified and either (1) eliminated or (2) minimized and controlled.

**[S]** Change language to say "... must be identified and either (1) eliminated or (2) minimized and controlled, in order to prevent adverse interaction ..."

**Response:**

*Accept*

Changed to the following:

(2) Ignition sources in NEAs must be identified and (1) eliminated or (2) minimized and controlled to prevent adverse interaction with combustible/flammable materials and the nuclear explosive.

(3) Combustible and flammable materials in NEAs must be identified and (1) eliminated or (2) minimized and controlled to prevent adverse interaction with nuclear explosive.

**DNFSB Comments for Att 1, 1.d.(2) & (3):**

**[C] In both sections, the language formerly said "identified and eliminated or minimized and controlled." The change to "reasonably minimized" greatly weakens these NESRs and makes them unenforceable. It is not consistent with the NES Standards to add the reasonable modifier to this NESR; either the language should be minimized and controlled or not. The term "reasonable" can mean "showing reason or sound judgment," which should be assumed will be done if it is not needed. Alternatively, "reasonable" can mean "having modest or moderate expectations; not making unfair demands" - if that is the intended meaning, then the NESR would not be strong enough to ensure the NES Standards are met. Either way, the addition of "reasonably" is inappropriate.**

**[S] Remove "reasonably" in 2 and 3**

**Response:**

*Accept*

"reasonably" removed from 1.d(2) and (3).

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME robbins12@llnl.gov**

The term 'reasonably' has been added to the term 'minimize'. This is unnecessary as NES evaluations are already qualitative and the use of additional subjective modifiers only obfuscates the intent. NESSG discussion should focus on whether the ignition sources and combustible materials have been minimized, not whether they are reasonable. It is understood that the term 'minimize' is similar to the use of 'prevent' in the NES standards; the objective is to drive the likelihood as low as reasonably practicable.

**Response:**

*Accept*

Removed "reasonably".

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**Linell Carter for Pantex - BWXT Pantex, LLC**

1.f.(1) Delete the language that reads "or explicitly addressed in an approved written procedure". This proposed change is consistent with the existing language in 4.a.(f).

**Response:**

*Accept*

Changed to the following:

(1) If it is determined that a nuclear explosive is no longer in a condition covered by a NES evaluation, all operations with that nuclear explosive and in the associated facility must be discontinued in a safe manner, resulting in a safe and stable nuclear explosive configuration.

## **2-4. Supplemental Nuclear Explosive Safety Rules: Nuclear Explosive Safety Evaluations: Human Factors**

**Major comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME james.jurich@hq.doe.gov**

Paragraph 4, Human Factors, second sentence should include the word "applicable" before "...NES standards of DOE O 452.1E". Recommend sentence read: "Given the human-centric nature of NEOs, human factors principles provide the basic foundation to ensure that NEOs are designed and conducted in a manner that meets human usability guidelines as well as the applicable NES standards of DOE O 452.1E". Recommend using the terms "applicable" when referring to regulations made applicable by another Order's CRD, otherwise it appears that it is made applicable in this CRD.

**Response:**

*Accept with Modifications* Deleted the sentence with "NES standards of DOE O 452.1E". However, there are only two NES standards, and they both apply to the evaluation of NEOs.

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:****Linell Carter for Pantex - BWXT Pantex, LLC**

Add language to the Human Factors section that only imposes the new human factors requirements onto startup NEOs and newly designed testers, tooling, facilities, and equipment. Existing NEOs that are undergoing OSRs or minor process modifications (i.e. NCEs) should not be subjected to the additional sc that could potentially be raised by this requirement. Proposed language is as follows: "Newly proposed (startup) NEOs must incorporate human factors principles into NEO procedures, processes, facility layouts, new tooling and new equipment, including new Category 1 electrical equipment, starting with the NEO design and development phase and maintained throughout the lifecycle of NEOs...." In addition, the following statement should be added: "Existing NEOs that are being evaluated under an OSR/NCE process should strive to meet human factors principles to the extent possible."

Reword the paragraph starting with the language "NEOs shall apply established...." to be consistent with the existing language in 4(a)(4). There is additional language in the CRD that is not contained in the body of the order.

**Response:**

*Accept with Modifications*

Changed to:

Human Factors. Newly proposed (startup) NEOs must incorporate human factors principles into NEO procedures, processes, facility layouts, new tooling and equipment, including Category 1 electrical equipment, starting with the NEO design and development phase and maintained throughout the lifecycle of NEOs. Existing NEOs that are being evaluated (i.e. during an OSR or NCE) should strive to meet human factors principles to the extent reasonably achievable.

When developing NEOs, the contractor must consider the application of established research in human factors and ergonomics, including human-system interface design, human cognition and perception, stress and workload, anthropometry and workspace design, environmental factors, training, and human error.

Also: Changed 4(a)(4) to be consistent with this section in the CRD.

**Suggested comment from Cathy Tullis for Headquarters NA****Included comments:****SME KELLYDJ@NV.DOE.GOV**

Recommend that standards be specified for the incorporation of human factors considerations into NEO activities.

**Response:**

*Accept with Modifications*

Changed to:

Human Factors. Newly proposed (startup) NEOs must incorporate human factors principles into NEO procedures, processes, facility layouts, new tooling and equipment, including Category 1 electrical equipment, starting with the NEO design and development phase and maintained throughout the lifecycle of NEOs. Existing NEOs that are being evaluated (i.e. during an OSR or NCE) should strive to meet human factors principles to the extent reasonably achievable.

When developing NEOs, the contractor must consider the application of established research in human factors and ergonomics, including human-system interface design, human cognition and perception, stress and workload, anthropometry and workspace design, environmental factors, training, and human error.

**SME William.Pulse@nnsa.doe.gov**

Recommend that the 2nd paragraph of Attachment 1, Paragraph 4 be used in the second paragraph of 452.2E, paragraph 4a(4) to ensure consistent implementation requirements (i.e., human-system interface design, stress and workload, etc.).

**Response:**

*Accept with Modifications*

Changed to:

Human Factors. Newly proposed (startup) NEOs must incorporate human factors principles into NEO procedures, processes, facility layouts, new tooling and equipment, including Category 1 electrical equipment, starting with the NEO design and development phase and maintained throughout the lifecycle of NEOs. Existing NEOs that are being evaluated (i.e. during an OSR or NCE) should strive to meet human factors principles to the extent reasonably achievable.

When developing NEOs, the contractor must consider the application of established research in human factors and ergonomics, including human-system interface design, human cognition and perception, stress and workload, anthropometry and workspace design, environmental factors, training, and human error.

Also: Changed 4(a)(4) to be consistent with this section in the CRD.

**5. Procedures****Suggested comment from Cathy Tullis for Headquarters NA****Included comments:****SME William.Pulse@nnsa.doe.gov**

CRD, paragraph 4 invokes human factors considerations for "NEO procedures, processes, facilities, tooling and equipment, including Category 1 electrical equipment." However, paragraph 5 invokes again the need to incorporate "human factors consideration" when the other areas of a NEO (e.g., facilities, tooling, etc.) do not repeat the requirement to incorporate human factors considerations. It is recommended that 5d(5) be removed as a duplicate requirement.

**Response:**

*Accept* Section 5.d.(5) of the CRD was deleted.

## 6-7. Two-Person Concept; Facilities

### Suggested comment from Cathy Tullis for Headquarters NA

#### Included comments:

SME Jose.Munoz@nnsa.doe.gov

Including "DOE O 452.2E, *Nuclear Explosive Safety*, or successor directive" w/in the text is not necessary and it is not consistent w/ the rest of the Order.

Replace "DOE O 452.2E, *Nuclear Explosive Safety*, or successor directive" w/ "this Order."

#### Response:

*Accept*

Changed to:

6. Two-Person Concept. Contractors responsible for NEOs and associated activities and facilities must establish and implement the two-person concept in accordance with Attachment 2 of this directive, to ensure no lone individual has access to a nuclear explosive.

### Suggested comment from Cathy Tullis for Headquarters NA

#### Included comments:

SME KELLYDJ@NV.DOE.GOV

It's suggested that this requirement be expanded to state contractors must ensure nuclear explosive areas (NEA) at facilities used for nuclear explosive operations are characterized, evaluated, and specifically approved for that use. The NEA distinction is important because facilities may have multiple missions in a user facility environment.

#### Response:

*Reject* I believe that I understand your direction generally, but I don't see a specific issue with leaving it the way it is. If I add NEAs at facilities, I would be concerned that someone would just characterize the NEA without concern how operations in the remainder of the facility would affect the NEA. For instance, at Pantex, there are both nuclear explosive assembly areas as well as high explosive manufacturing areas. While NES does not explicitly require the HE manufacturing areas to be characterized and evaluated for NES, they are characterized and evaluated for explosive safety purposes, and the site does look at controls that ensure what happens in those areas cannot affect the nuclear explosive area (e.g. explosives limits, distances from nuclear explosive areas, etc.).

## 8. Equipment

### Major comment from Cathy Tullis for Headquarters NA

#### Included comments:

Linell Carter for Pantex - BWXT Pantex, LLC

8.e. Energetic equipment intended for use in NEAs by emergency responders that must be evaluated and characterized with respect to potential hazards should include security force equipment. Due to the nature of emergency scenarios that would mandate a security force response, this evaluation would be counterproductive and could unnecessarily impede security from responding as needed to a significant event. Accordingly, the reference to "security force" should be deleted.

#### Response:

*Reject* Currently, security equipment is evaluated by a NESSG during the Security Master Study. An emergency would take precedence over NES controls; however, equipment intended for use in an NEA should be evaluated by NES. This does not preclude the introduction of additional equipment should an emergency occur. However, known equipment should be evaluated.

## 9-10. Maintenance of Facilities; Personnel

### Major comment from Steve Duarte for Headquarters GC

#### Included comments:

SME james.jurich@hq.doe.gov

Paragraph 10 Personnel - Recommend adding the word "applicable" in the sentence that starts with "In addition to the requirements in 10 CFR Part 712". It should be changed to read: "In addition to the applicable requirements in 10 CFR Part 712..."

The term "applicable" needs to be included when referring to requirements made applicable by another regulation or another of DOE's Order's CRD - otherwise it appears those provisions are being made applicable in this CRD. Each DOE Order had to be made applicable to contractors by its own CRD.

#### Response:

*Accept* Inserted "applicable" prior to "...requirements in 10 CFR Part 712".

SME robin.henderson@hq.doe.gov

Please edit the second sentence as follows: "

In addition to the **applicable** requirements in 10 CFR Part 712, *Human Reliability Program*, and DOE O 426.2, *Personnel Selection, Training, Qualification Certification Requirements for DOE Nuclear Facilities*, contractors must provide annual training for personnel assigned to nuclear explosive duty **that must** include the following NES-specific topics."

#### Response:

*Accept* Inserted "applicable" prior to "...requirements in 10 CFR Part 712". Revised sentence as follows, "... assigned to nuclear explosive duty that include following NES-specific topics."

## **11. Transportation of Nuclear Explosives**

### **Major comment from Cathy Tullis for Headquarters NA**

#### **Included comments:**

##### **Linell Carter for Pantex - BWXT Pantex, LLC**

Suggest deleting the introductory sentence that reads "Nuclear explosive transportation is a mobile NEO and involves a mobile NEA." It is too subjective and does not clearly convey a requirement.

##### **Response:**

*Reject*

The requirement is stated to make it clear that the NES hazards encountered during transportation must be considered, and the area that the nuclear explosive occupies must be treated as a nuclear explosive area. As Section 11.a. states, contractors establish the specific requirements and procedures to ensure safe transportation of nuclear explosives. Therefore, contractors may determine the area around the nuclear explosive that constitutes the NEA and based upon the nuclear explosive transportation configuration. For example, during onsite truck transportation, the contractor may determine that the NEA consists of the area inside the truck (i.e. the trailer) with the doors of the truck closed because they have determined that all of the hazards are bounded by those considered in on-road transportation.

### **Suggested comment from Cathy Tullis for Headquarters NA**

#### **Included comments:**

##### **SME KELLYDJ@NV.DOE.GOV**

Additional specificity needs to be added how to treat nuclear explosive transportation as a mobile NEA. For example, how are other vehicles to be addressed as an ignition source and how is off the road vegetation to be addressed as combustible material.

##### **Response:**

*Reject*

The requirement is stated to make it clear that the NES hazards encountered during transportation must be considered, and the area that the nuclear explosive occupies must be treated as a nuclear explosive area. As Section 11.a. states, contractors establish the specific requirements and procedures to ensure safe transportation of nuclear explosives. Therefore, contractors may determine the area around the nuclear explosive that constitutes the NEA and based upon the nuclear explosive transportation configuration. For example, during onsite truck transportation, the contractor may determine that the NEA consists of the area inside the truck (i.e. the trailer) with the doors of the truck closed because they have determined that all of the hazards are bounded by those considered in on-road transportation.

## **12-14. Mixed Venues; Positive Verification; Change Control**

### **Major comment from Cathy Tullis for Headquarters NA**

#### **Included comments:**

##### **SME robbins12@llnl.gov**

The exceptions are much too specific for a DOE Order. From a safety perspective, I would question whether an exception is ever truly necessary and remove the noted exception. If it is desired to establish a process for exceptions to this requirement, there is no need to mention specific operations/facilities by name.

##### **Response:**

*Accept with Modifications* Deleted the sentence, "Exception: Nuclear explosives and NELAs may be collocated...". Added, "If operational constraints require nuclear explosives and NELAs to be collocated, the operations must comply with the NELA standards in paragraph 17 of this attachment and must be evaluated against a NESSG. The operational justification for collocation of the nuclear explosives and NELAs will be provided to the NESSG during the evaluation."

## **15. Anomalous Unit Determination and Processing**

### **Suggested comment from Cathy Tullis for Headquarters NA**

#### **Included comments:**

##### **SME KELLYDJ@NV.DOE.GOV**

Additional specificity must be added for how contractors support the OST NEO change control process. Contractor interface to this Federal change control process is unknown making it difficult to comply with this requirement.

##### **Response:**

*Reject*

The OST change control process is explained in NA SD 452.2. The OST manual has additional information on how to perform this process.

### **Major comment from Steve Duarte for Headquarters GC**

#### **Included comments:**

SME robin.henderson@hq.doe.gov

Re: paragraph a., the sentence is confusing. Do you mean to say that they must act together to declare a unit anomalous? --That is what it currently says, but seems inconsistent with the follow-on sentence which says that they must act jointly to declare the unit NOT anomalous. Please clarify.

**Response:**

*Accept with Modifications*

Changed to: The production agency Process Engineer, production agency NES representative, and design agency System Engineer collectively have the authority to declare a unit anomalous. If the three cannot agree that the unit in question is not anomalous, then the unit will be treated as anomalous. The design agency Engineer may solicit input from their respective design agency NESSG member(s) prior to making an anomalous unit determination.

Change also made in 4a(15)(a).

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**Linell Carter for Pantex - BWXT Pantex, LLC**

15.b.(1) Add a sentence to read: "A NESSG-certified member from the design agency must be involved in the review. This review must be documented in the engineering release." This proposed change is consistent with the existing language in 4 a (15) (b) 1.

**Response:**

*Accept*

Changed to:

(1) The responsible design agencies must specifically review the engineering release for impact on NES. A NESSG-certified member from the design agency must be involved in the review. This review must be documented in the engineering release.

**SME robbins12@llnl.gov**

Under SMT guidance, Pantex has interpreted the memo from Dr Greenaugh regarding anomalous unit guidance differently than what is suggested here. I have two differences are worth highlighting and updating in this section of the Order.

1) While the personnel mentioned in the draft certainly provide relevant input, the final anomalous unit decision is coordinated with senior management delegates at each affected site. Senior management consists of the following

- Pantex - General Manager
- Sandia National Laboratory – Director, Weapons Systems Engineering (CA or NM)
- Lawrence Livermore National Laboratory - Program Director Nuclear Weapon Engineering (NWE) Program
- Los Alamos National Laboratory – Associate Director for Weapon Engineering Experiments

**2)Reassessment of an Anomalous Unit Declaration**

If additional information is obtained after a unit has been declared anomalous, the new information shall be evaluated to determine if the unit remains anomalous. This process is effectively the same as a new anomalous unit determination.

**Response:**

*Accept with Modifications*

Once a unit is declared anomalous, it must be treated as anomalous unless new information is presented that demonstrates no anomaly is present.

Added:

(4) If additional information is obtained after a unit has been declared anomalous (e.g. from a radiograph), the new information shall be evaluated to determine if the unit should remain anomalous.

**16-17. Configuration Management: Nuclear Explosive-Like Assemblies (NELAs)**

**Suggested comment from PK Niyogi for Headquarters NE**

**Included comments:**

**SME christja@id.doe.gov**

Recommend including reference to DOE O 420.1C configuration management requirements to ensure that the requirements of both orders are included in contractor CM programs.

**Response:**

*Reject*

The Configuration Management requirements from DOE O 420.1C are expected to be invoked by contract separately.

**18-19. Marking Instructions: Records**

**ATTACHMENT 2. TWO-PERSON CONCEPT REQUIREMENTS: 1. BASIC REQUIREMENTS**

**2. IMPLEMENTATION OPTIONS**

### 3. WHEN TO APPLY PERSON-TO-PERSON COVERAGE

#### Major comment from Steve Duarte for Headquarters GC

##### Included comments:

SME [robin.henderson@hq.doe.gov](mailto:robin.henderson@hq.doe.gov)

Please change the beginning of paragraph (2) to read as follows: "Coverage must continue . . ."

##### Response:

*Accept* Changed the beginning of paragraph (2) to read as follows: "Coverage must continue . . ."

#### Suggested comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME [Jose.Munoz@nnsa.doe.gov](mailto:Jose.Munoz@nnsa.doe.gov)

Attachments 3 & 4 contain requirements regarding application of the TPC that should be moved to this section, e.g.:

##### Attachment 3 ELECTRICAL EQUIPMENT REQUIREMENTS

c. Two-Person Concept.

Category 1 electrical equipment requires two-person concept protection. (The TPC is delineated in Attachment 2 of this Order.)

(1) Person-to-person coverage is required during calibration and all operations that afford internal access to Category 1 electrical equipment and associated and adapters, and while Category 1 electrical equipment is connected to a nuclear explosive.

(2) Zone coverage is required for fully assembled Category 1 electrical equipment and associated cables and adapters when that equipment is not protected dual-lock system or other NES-approved security system.

##### Attachment 4 NUCLEAR EXPLOSIVE-LIKE ASSEMBLY (NELA) REQUIREMENTS

##### 3. ASSEMBLY/DISASSEMBLY OF NUCLEAR EXPLOSIVE-LIKE ASSEMBLIES.

NELAs must not be assembled or disassembled in close proximity to nuclear explosives where components may be interchanged. A two-person concept team is required to perform all assembly/disassembly operations on Inert-with-Live-Pit NELAs.

##### Response:

*Reject*

It is not necessary to repeat the requirements in both places. Because the requirements related to both Category 1 electrical equipment and two-person concept (NELAs and two-person concept), the requirements may be detailed in one section and referenced in the other. In Paragraph 1 of Attachment 2, the sentence "The TPC is also required in the Metrology Laboratory as specified in Attachment 3 paragraph 2.c of this Order and for certain NELA assembly steps as specified in Attachment 4 paragraphs 3 and 4 of this Order." was changed to, "The TPC is also required for Category 1 electrical equipment, as specified in Attachment 3 paragraph 2.c of this Order and for certain NELA assembly steps as specified in Attachment 4 paragraphs 3 and 4 of this Order."

### 4. HOW TO APPLY PERSON-TO-PERSON COVERAGE

#### ATTACHMENT 3. ELECTRICAL EQUIPMENT REQUIREMENTS: 1. BASIC REQUIREMENTS

#### 2. CATEGORY 1 ELECTRICAL EQUIPMENT

#### 3. CATEGORY 2 ELECTRICAL EQUIPMENT

#### 4-5. CATEGORY 3 ELECTRICAL EQUIPMENT: NES EVALUATIONS AND CHANGE CONTROL

#### Major comment from Cathy Tullis for Headquarters NA

##### Included comments:

SME [robbins12@llnl.gov](mailto:robbins12@llnl.gov)

The Approved Equipment Program Module 1, NES Master Study, post-start finding (3.3.7) determined there was a NES deficiency due to key documents pertaining to Category 1 Electrical Equipment not being under NES change control. The documents included Category 1 Electrical Equipment design guidance (currently specified in DG10001) and Category 1 Electrical Equipment process requirements (currently specified in EP401075). In the Approval Memo from the Assistant Deputy Administrator for Stockpile Management dated February 5, 2013, NA-121.1 was tasked to bring these documents under NES Change Control. This section of 452.2E would seem to be the appropriate place to fulfill this tasking. Suggested wording to add to this section:

Contractor documents which specify NEO Electrical Equipment design requirements (currently DG100001) and NEO Electrical Equipment process requirements (currently EP401075) are subject to the NES evaluation and NEO change control processes required by this Order and detailed in NA 452.2, *Nuclear Explosive Safety Evaluation Processes*.

**Response:**

*Accept with Modifications*

Added the following:

Design agency documents which specify general design and process requirements for Category 1 electrical equipment used on nuclear explosives (e.g. DGI and EP401075) are subject to NES evaluation. Changes to these documents must be concurred with by each design agency NES organization. This concurrence must be documented in an engineering authorization.

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME ROGERSKY@NV.DOE.GOV**

NA SD 452.2 is different than what is listed in the references section. Suggest that they be consistent.

**Response:**

*Accept* In References Section: "Nuclear Explosive Safety Study Processes" was changed to "Nuclear Explosive Safety Evaluation Processes".

**ATTACHMENT 4. NUCLEAR EXPLOSIVE-LIKE ASSEMBLY (NELA) REQUIREMENTS: 1. NUCLEAR EXPLOSIVE-LIKE ASSEMBLY DEFINITION**

**Suggested comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME james.jurich@hq.doe.gov**

Need to add "...and its CRD" to the sentence that reads: "The following requirements support the NELA standards defined in paragraph 4a(17)(a) of this Order and its CRD". It reads "The following requirements support the NELA standards defined in paragraph 4a(17)(a) of this Order and its CRD".

**Response:**

*Accept with Modifications*

Changed to the following:

This Attachment applies to both Federal and contractor organizations. The following requirements support the NELA standards defined in paragraph 4a(17)(a) of this Order and paragraph 17a of the CRD (Attachment 1 of this Order).

**Major comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME robbins12@llnl.gov**

Requiring all 4 of the attributes above seems like too restrictive of a definition. For example, can incorrect weight ensure the prevention of component substitution resulting in accidental, inadvertent, or deliberate unauthorized assembly or transfer of a nuclear explosive.

**Response:**

*Reject* These criteria were developed during the NELA joint working group meetings. The intention is to not require things like empty aeroshells and static displays from having to meet the NELA requirements.

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**SME robbins12@llnl.gov**

It is unclear how the second sentence in 1.c. applies to the NELA definition. Does this mean if you can tell it is not a nuclear explosive by visual inspection, then it is not NELA? If so, that case is covered by the first sentence of 1.c. and so the second sentence can be removed.

**Response:**  
*Accept with Modifications*

Changed to the following:

C. Resembles a nuclear explosive to the degree that it can be mistaken for a nuclear explosive (without any disassembly).

Note: Availability of a simple visual inspection (such as a viewing port to internal components) is adequate to assure that an item would not be mistaken for actual nuclear explosive, and therefore would not be considered a NELA and would not have to meet the NELA requirements in this Attachment.

**SME Jose.Munoz@nnsa.doe.gov**

Section 6 (Definitions) of the Order already has a definition for NELAS.

Recommend deleting this definition or replacing definition in Section 6 of the Order w/ this definition.

**Response:**  
*Accept with Modifications*

The definition in Section 6 was changed to the following:

Nuclear Explosive-Like Assembly (NELA). An assembly that is not a nuclear explosive but represents a nuclear explosive in its basic configuration (main body, HE and pit) or any higher level of assembly up to a fully assembled weapon configuration. A NELA does not contain an arrangement of high explosive (HE) or fissile material capable of producing a nuclear explosive detonation.

The details in this section provide additional guidance on what items must apply NELA requirements.

So we have three categories:

1. Nuclear Explosives, which have very strict controls
2. NELAs, which look a whole lot like a nuclear explosive, so there must be controls in place to ensure that we don't mix up an NE with a NELA
3. Items which kind of look like a nuclear explosive, but any knowledgeable person can readily tell that they are not; therefore the expense of NELA controls should not be applied.

## **2. NUCLEAR EXPLOSIVE-LIKE ASSEMBLY TYPES**

### **3. ASSEMBLY/DISASSEMBLY OF NUCLEAR EXPLOSIVE-LIKE ASSEMBLIES**

### **4. VERIFICATION OF NUCLEAR EXPLOSIVE-LIKE ASSEMBLY COMPONENTS BEFORE ASSEMBLY.**

**Suggested comment from Sharon Edge-Harley for Headquarters IEA (Independent Enterprise Assessment)**

EA-10-20-30 POC: Kathy McCarty 3-8812

Attachment

4, section 4.b. - suggested comment: The third numbered section should be (3) versus (1). In that section, it appears that the references to paragraphs 4c(1) and 4c(2) should be 4b(1) and 4b(2).

**Response:**  
*Accept Corrected.*

**Suggested comment from Steve Duarte for Headquarters GC**

**Included comments:**

**SME robin.henderson@hq.doe.gov**

In paragraph (b), there is a mistaken line ending and extra line after "achieved by a."

**Response:**  
*Accept Corrected.*

**Suggested comment from Cathy Tullis for Headquarters NA**

**Included comments:**

**Jennifer Bitsie for Sandia Field Office**

This should be section (3), not section (1). Also, the paragraphs cited in the sentence should be 4b(1) and 4b(2), not 4c(1) and 4c(2). (Changed to Major to Suggested per SFO)

**Response:**

*Accept* Corrected. "(1)" renumbered to "(3)". Referenced paragraphs changed to "4b(1) and 4b(2)".

## **5. OFFSITE TRANSPORTATION OF NUCLEAR EXPLOSIVE-LIKE ASSEMBLIES.**

**Suggested comment from Sharon Edge-Harley for Headquarters IEA (Independent Enterprise Assessment)**

EA-10-20-30 POC: Kathy MCarty 3-8812.

Attachment

4, section 5.c. - suggested comment: It is not clear what is meant by the term "DOE Agencies" since DOE is typically considered to be a single Agency or Executive Department. Clarify depending on the intent of the section. If this is intended to mean "design agencies" as the term design agency is used elsewhere in this document, consider adding a definition of the term "design agency."

**Response:**

*Accept with Modifications*

Changed "DOE Agencies" to "NNSA Sites".

## **ATTACHMENT 5. MARKING REQUIREMENTS: 1. PERMANENT MARKINGS**

### **2. PERMANENT MARKING LOCATION**

### **3. PERMANENT MARKINGS**

### **4. PERMANENT MARKING OBLITERATION**